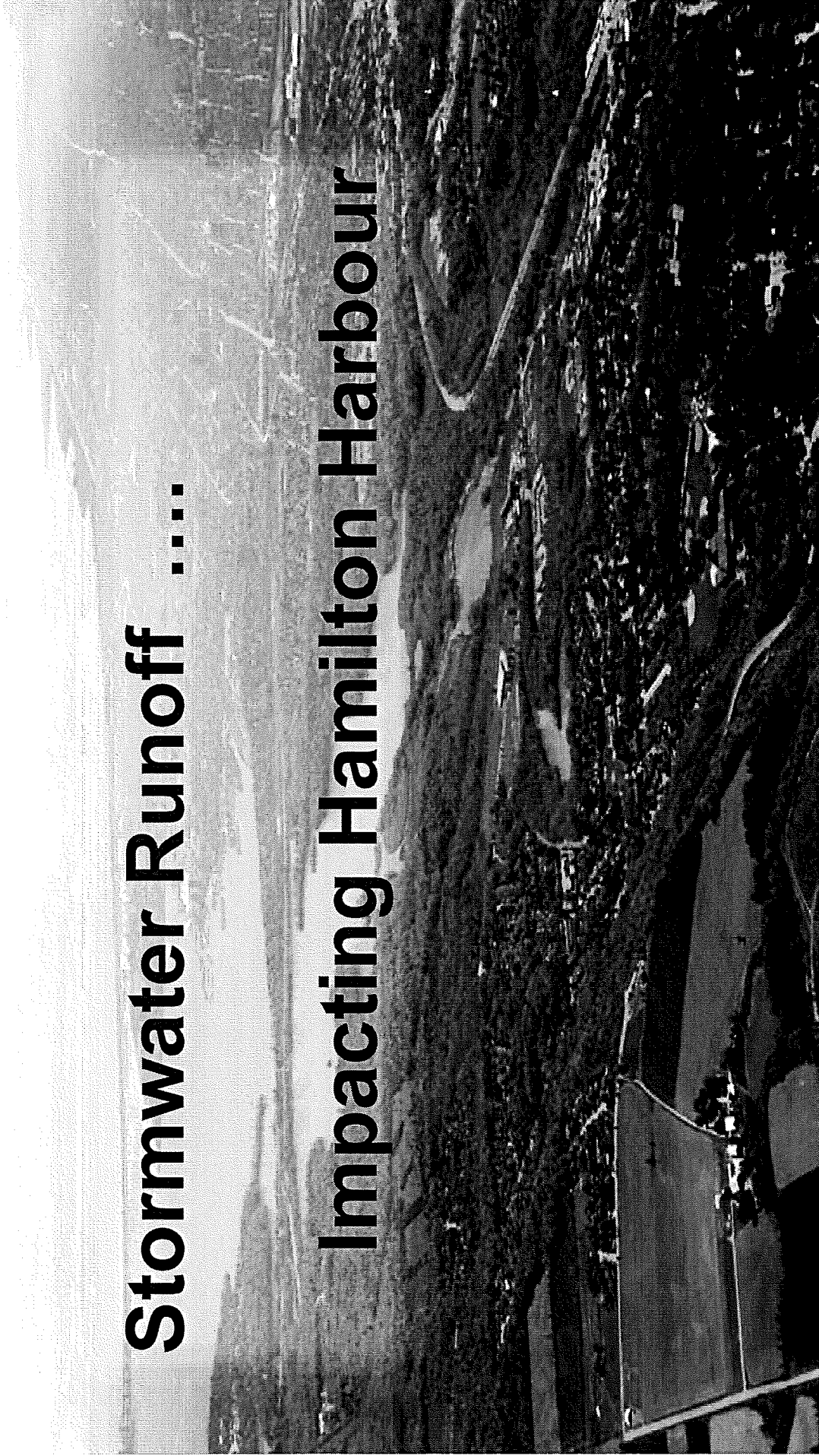
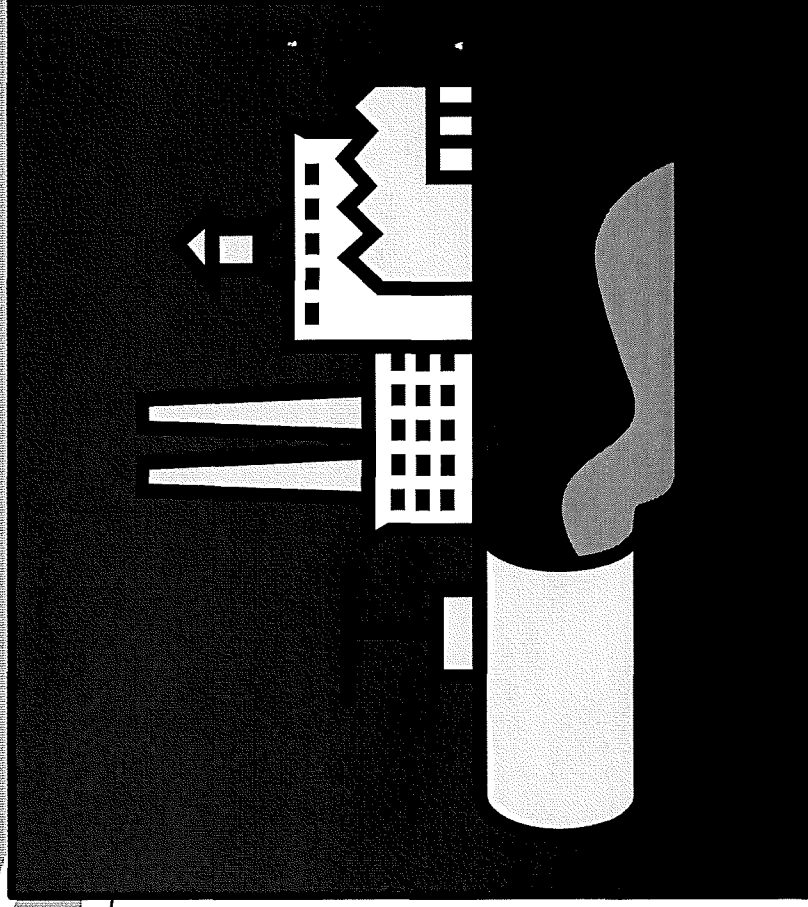
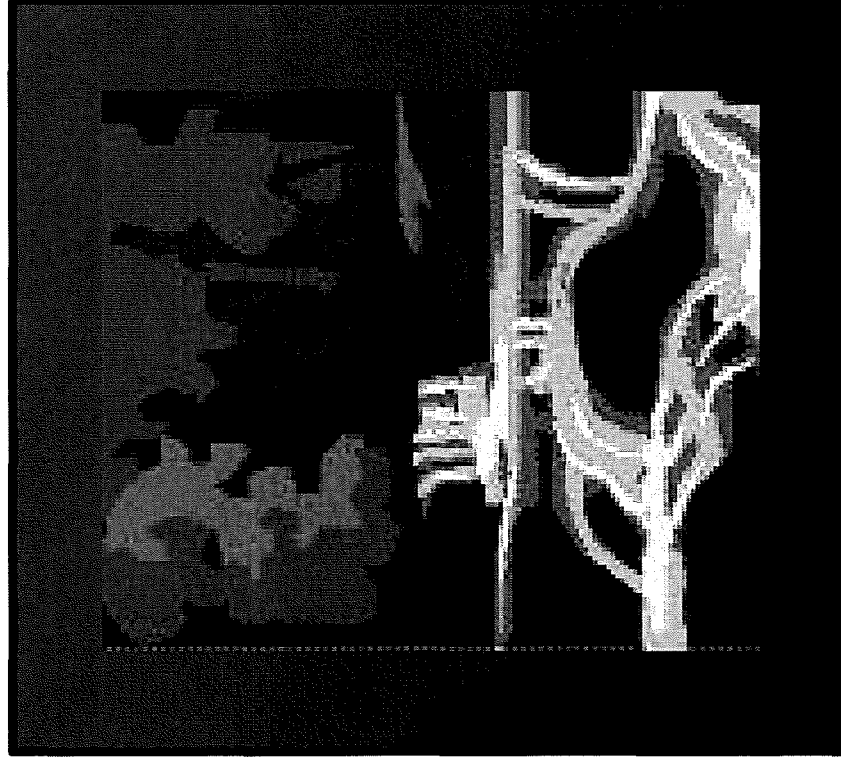


# Stormwater Runoff .....

## Impacting Hamilton Harbour

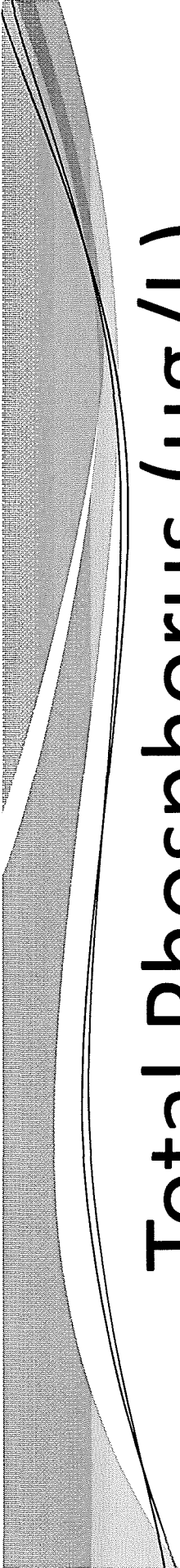


# Flow Ratio to the Harbour

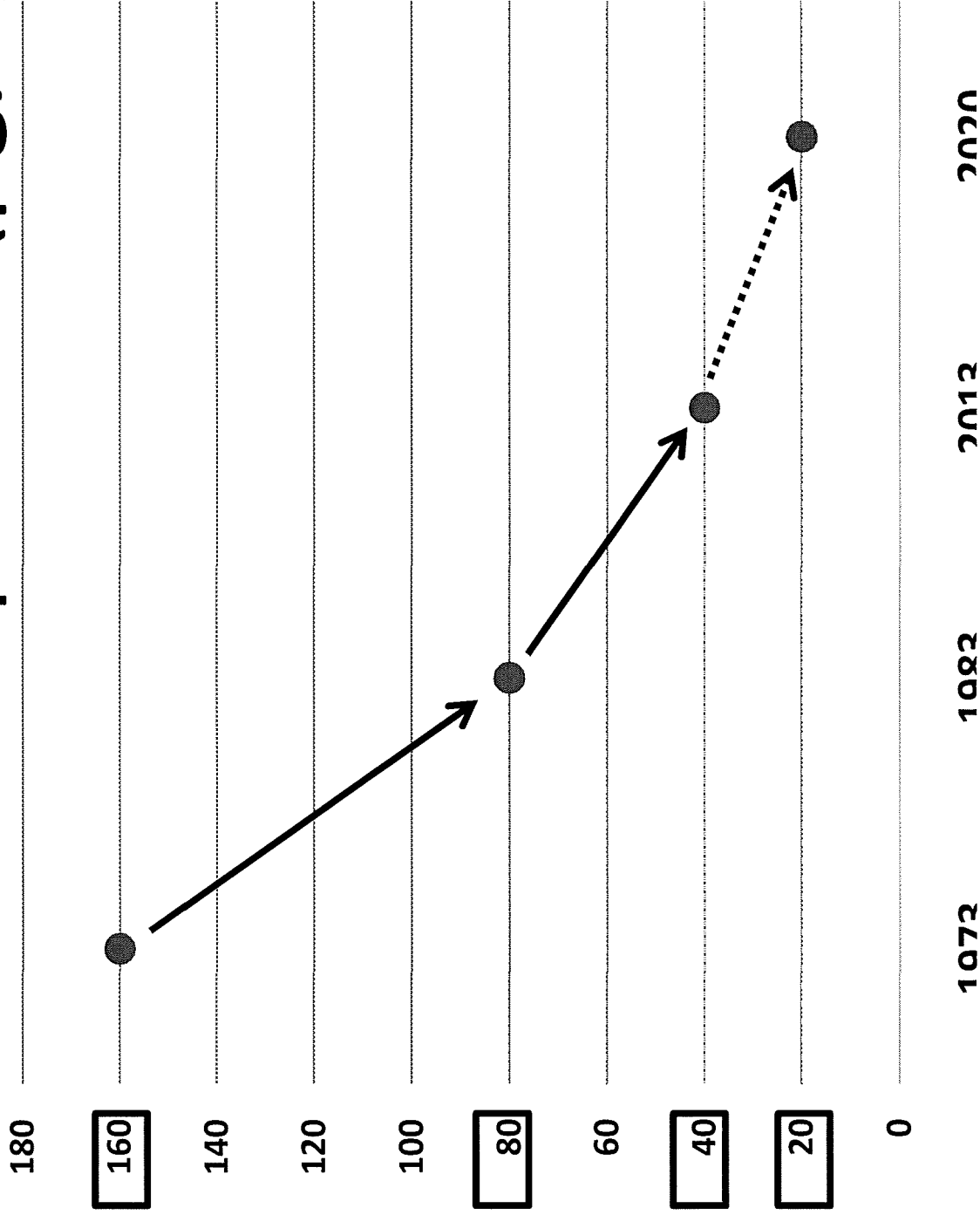


WWTPs = 50%

Watersheds = 50%

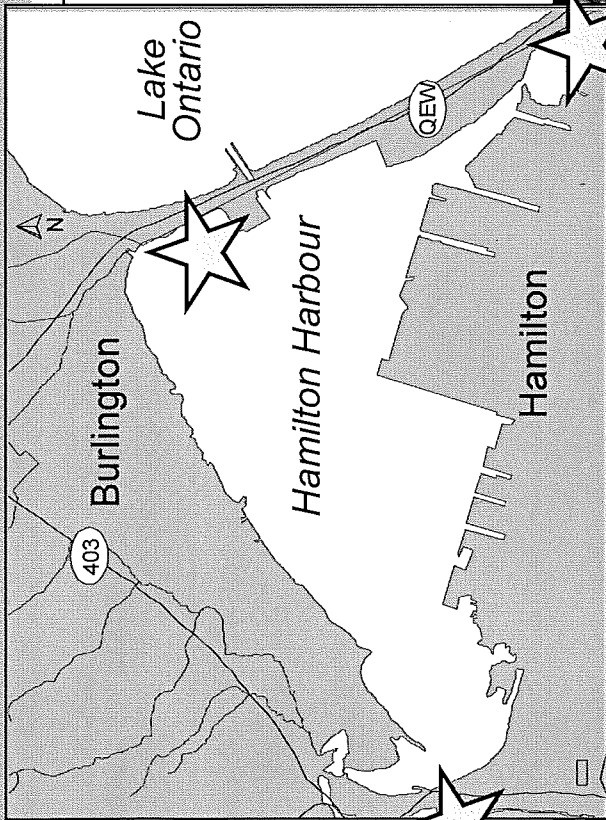


# Total Phosphorus ( $\mu\text{g}/\text{L}$ )



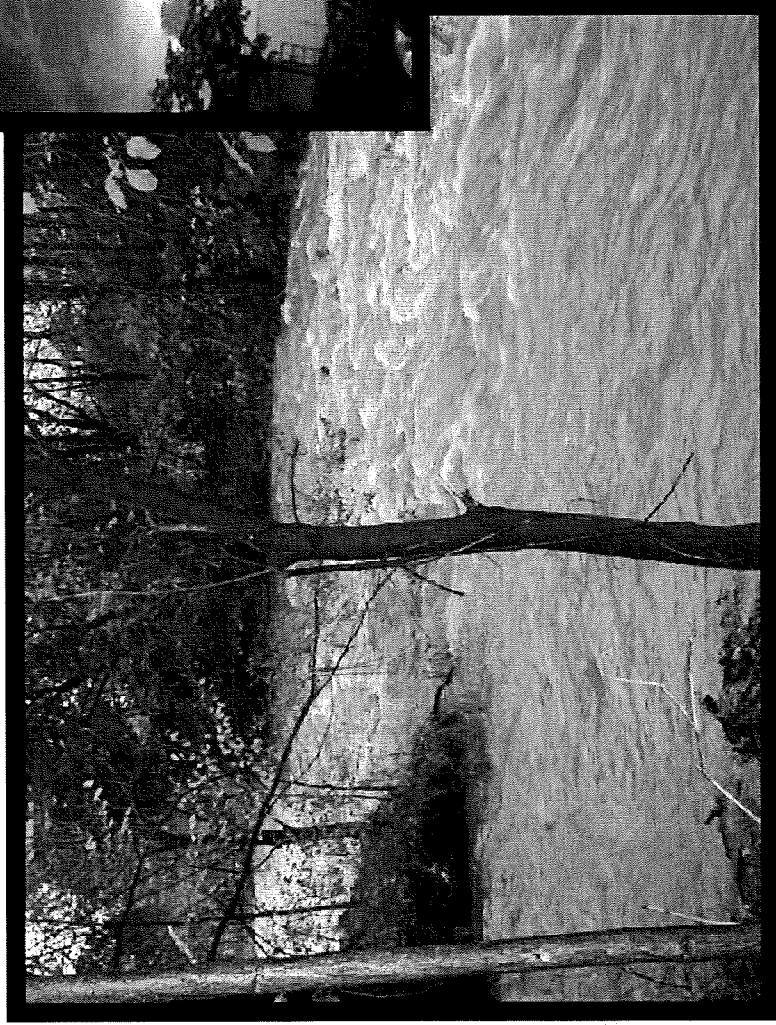


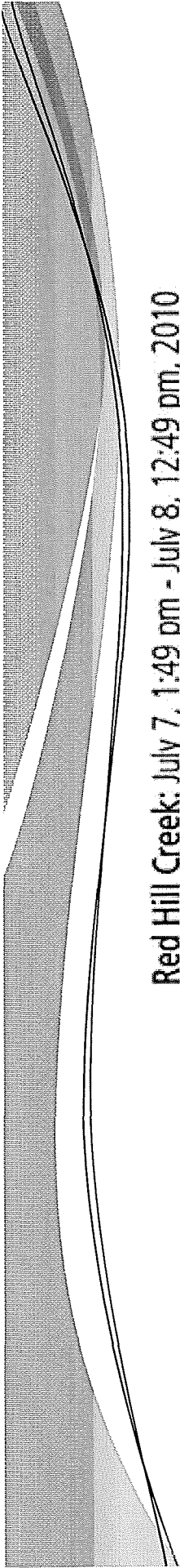
# 3 Wastewater Treatment Plants



# Watershed Challenges

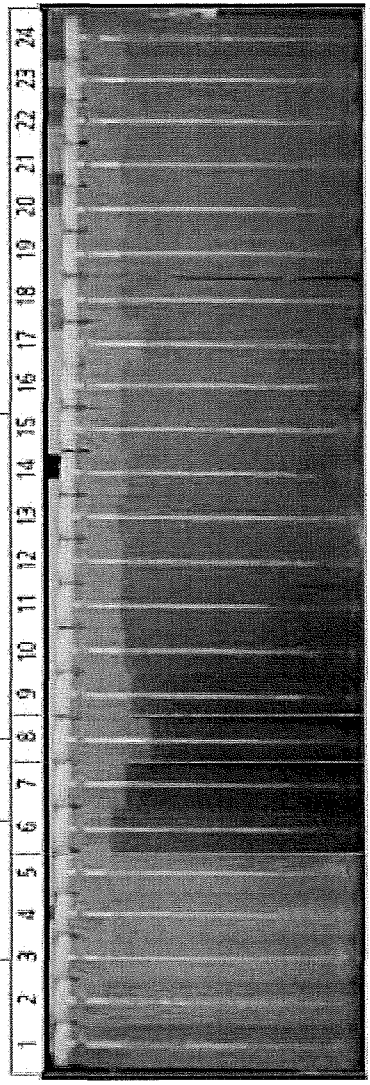
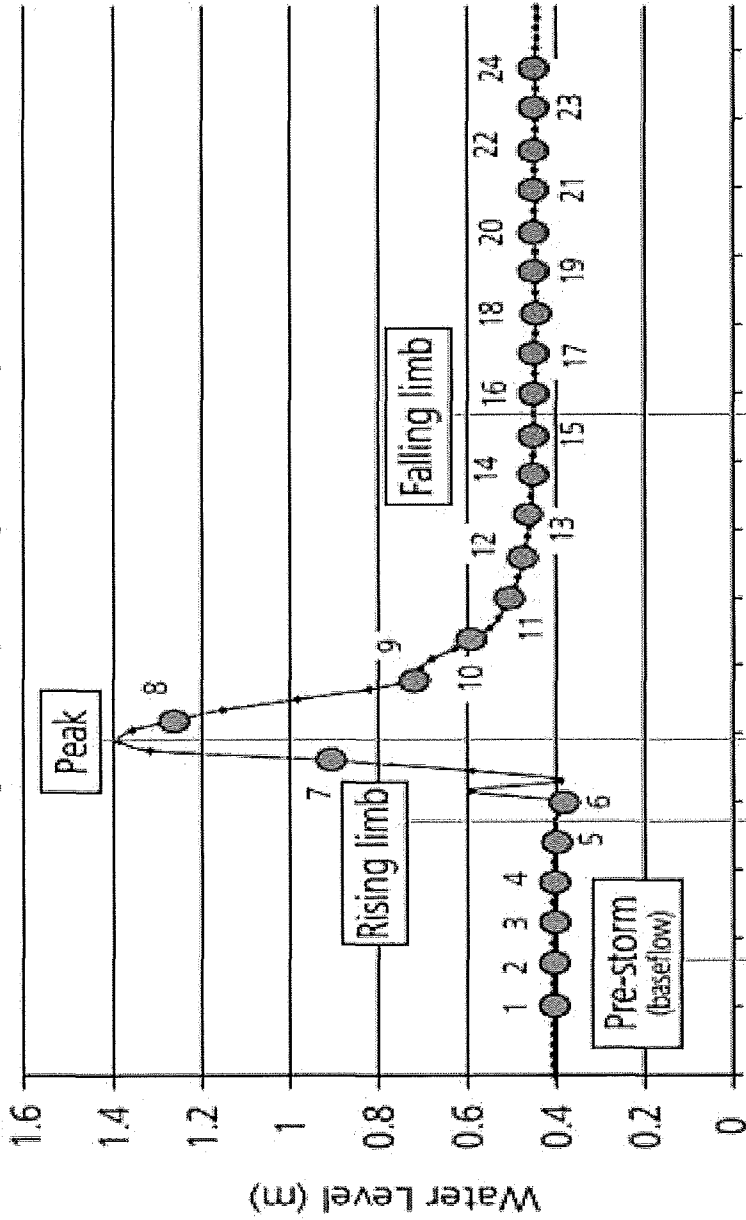
- Climate Change
- Phosphorus pulses from storms





# What a Storm Looks Like

Red Hill Creek: July 7, 1:49 pm - July 8, 12:49 pm, 2010



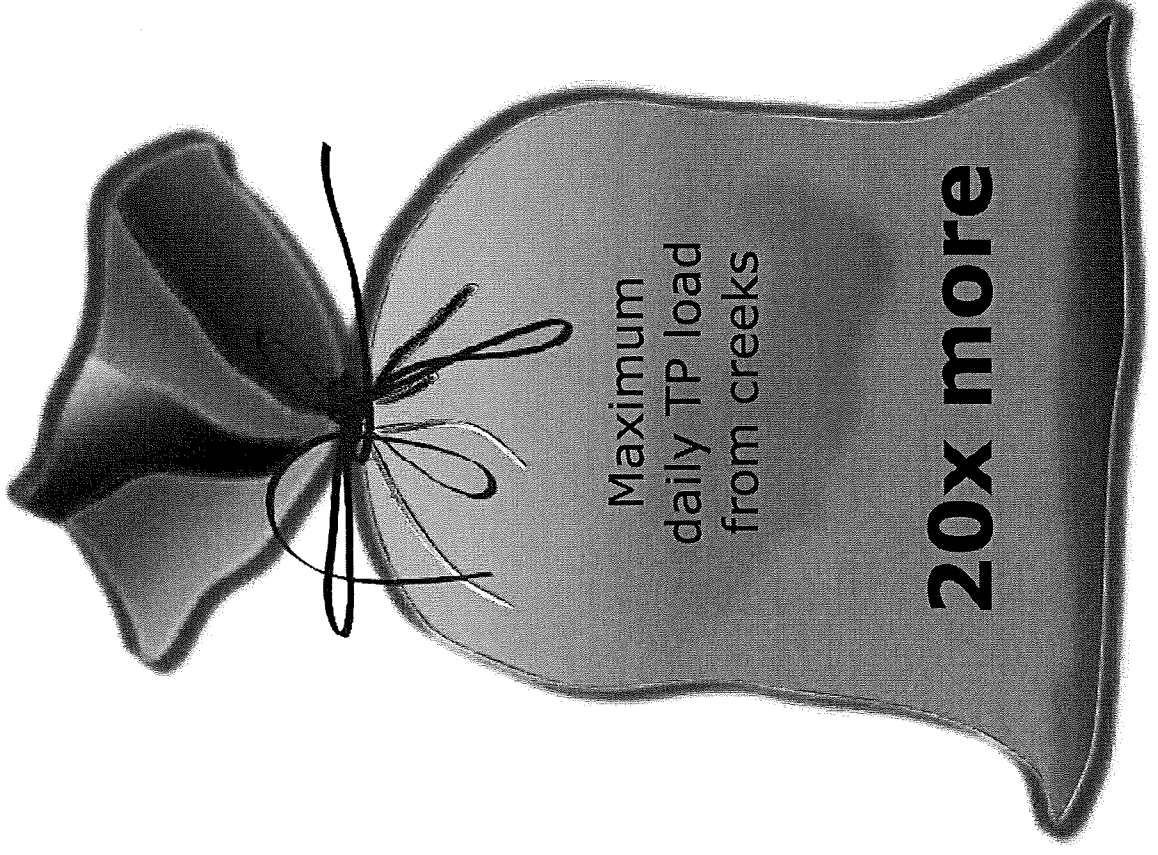
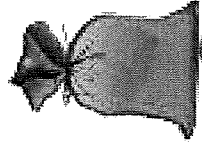


| <b>CREEKS</b>    | <b>Min daily load (kg/d)</b> | <b>Max daily load (kg/d)</b> | <b>Event of maximum loading</b>  |
|------------------|------------------------------|------------------------------|----------------------------------|
| Red Hill Creek   | 0.1                          | 841                          | Sep 28-29, 2010 (54.8 mm)        |
| Indian Creek     | 0.1                          | 152                          | Nov 29-30, 2011 (40.2 mm)        |
| Grindstone Creek | 0.2                          | 334                          | Mar 10-11, 2011 (22.1 mm + melt) |
| Desjardins Canal | 1.8                          | 704                          | Mar 11-12, 2011 (9.6 mm + melt)  |
| <b>Total</b>     | <b>2.2</b>                   | <b>2031</b>                  |                                  |

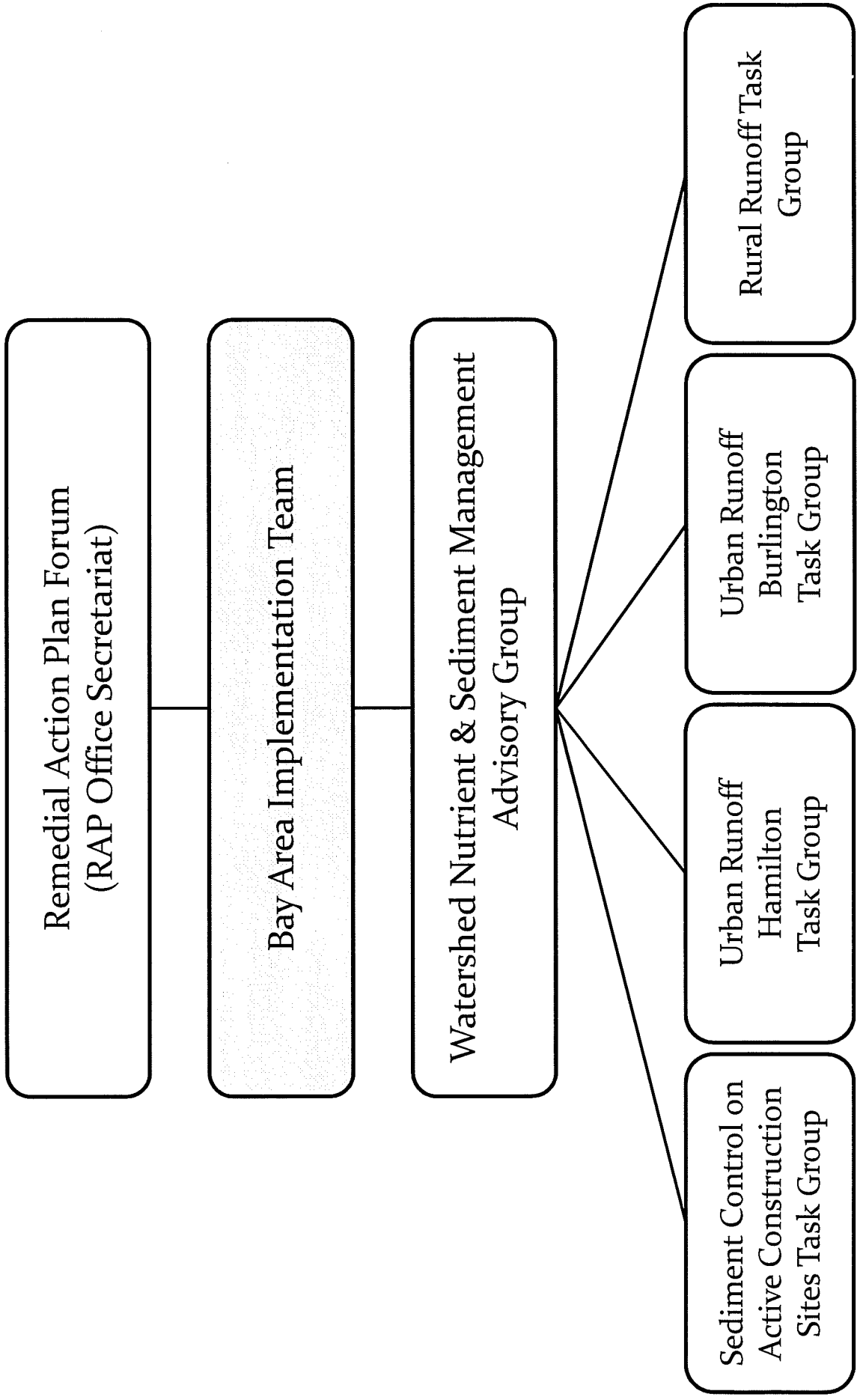
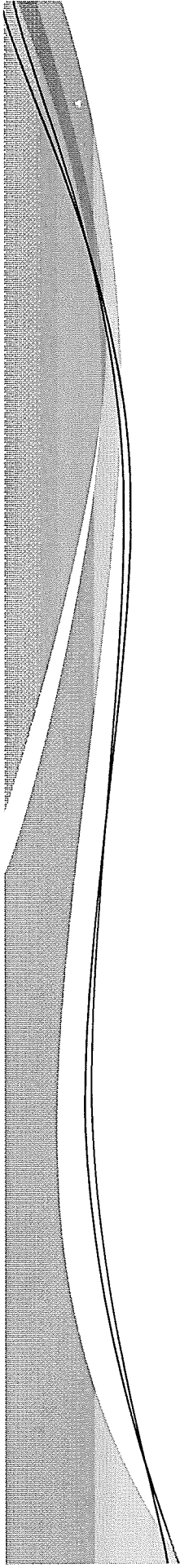
| <b>WWTPs</b>                  | <b>Skyway</b>  | <b>Woodward + CSO</b> | <b>Total</b> | <b>Max creek loads relative to WWTP loads</b> |
|-------------------------------|----------------|-----------------------|--------------|---|
| Current load (kg/d)           | (previous) 20  | 156                   | 176          | 12 times greater                              |
| Final load (kg/d) (objective) | (objective) 12 | 82                    | 94           | 20 times greater                              |

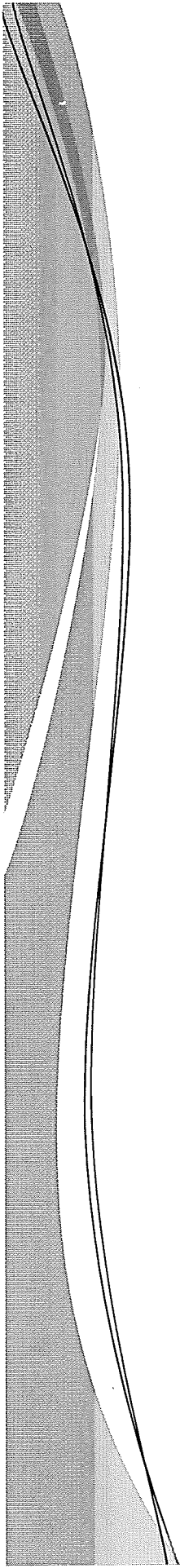
# Phosphorus from Creeks

Maximum daily  
TP load from  
upgraded  
wastewater  
treatment plants







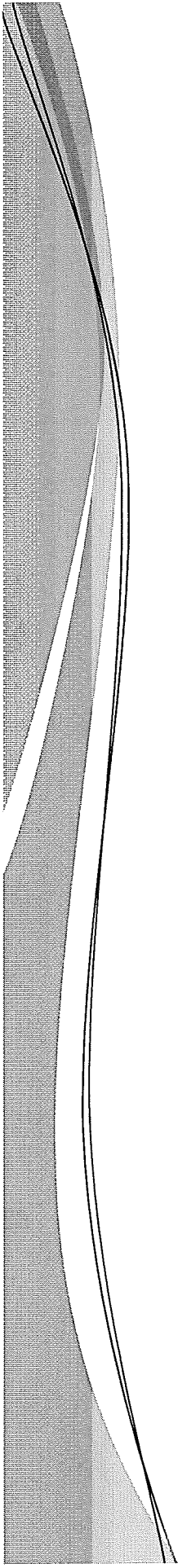


# Urban Runoff Task Groups

Federal, Provincial, Municipal, Conservation Authorities

## Examined:

- Stormwater Management for New Development
- Opportunities to Improve Existing Stormwater Infrastructure
- How to Fund Stormwater Infrastructure
- Opportunities for Private Properties

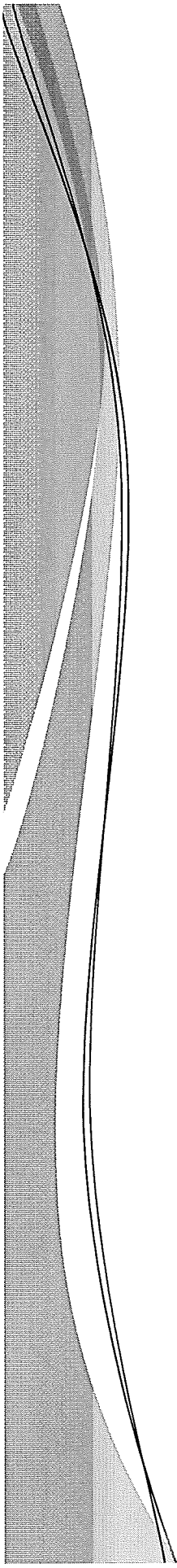


# Urban Runoff Task Groups

“Time of Change”

**Stormwater**

**Conveyance ..... Infiltration**



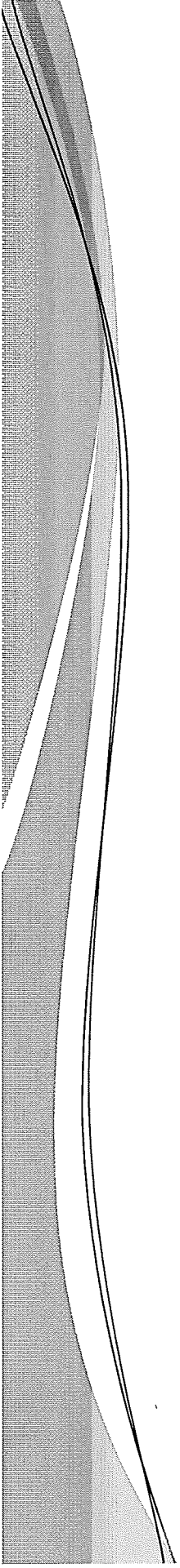
# Urban Runoff Task Groups

## Recommendations:

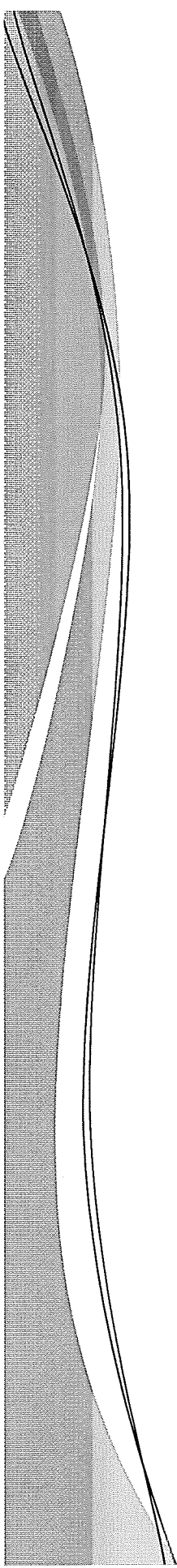
1. **Guidelines and Manuals**
2. **Programs**
3. **Training**
4. **Resourcing Stormwater Infrastructure**

“Time of Change”





# **Hamilton Urban Runoff Task Group Recommendations**



# What is the HHRAP Request?

**That the City of Hamilton direct its staff to review the recommendations contained in the:**

*“Hamilton Harbour Remedial Action Plan, Urban Runoff, Hamilton, Report and Recommendations for Nutrient and Sediment Management, dated October 20, 2016”*

**and report back with respect to implementation.**

# Hamilton Harbour

**A Vibrant  
Centrepiece in  
Our  
Community's  
Life**

